

Abstract

To obtain a conductive metal film having superior step coverage, adhesiveness, and high productivity. A conductive metal film or metal oxidized film suitable as a capacitor electrode is formed on a substrate by performing an excited-gas supplying step after a source gas supplying step. In the source gas supplying step, gas obtained by vaporizing an organic source is supplied to the substrate, and the gas thus supplied is allowed to be adsorbed on the substrate. In the excited-gas supplying step, oxygen or nitrogen containing gas excited by plasma is supplied to the substrate to decompose the source adsorbed on the substrate, thus forming a film. An initial film-forming step is a step of forming the film by repeating the source gas supplying step and the excited-gas supplying step once or multiple times. A desired thickness can be obtained by one step of the initial film-forming step. However, thereafter, in addition to the initial film-forming step, the film-forming step may be two steps by performing the main film-forming step of simultaneously supplying the gas obtained by vaporizing the organic source and oxygen containing gas or nitrogen containing gas not excited by plasma by using a thermal CVD method.